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# Pest Management News

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OFFICIAL NEWSLETTER OF THE INTEGRATED PEST MANAGEMENT RESEARCH, DEVELOPMENT AND APPLICATIONS PROGRAM  
2500 SHREVEPORT HIGHWAY · PINEVILLE, LOUISIANA 71360

## Symposium Highlights IPM Practices

The Integrated Forest Pest Management Symposium was held at the History Village Conference Center in Athens, Georgia, June 18-21, 1984, to present available technology on insect, disease, vegetation, and animal pest management and to identify future needs. More than 100 conferees participated in the meetings, sponsored by Federal, State, university, and industry organizations under the auspices of the Georgia Center for Continuing Education. Pest management specialists and interested parties from across the South and as far away as Illinois, New Mexico, and Oregon were in attendance.

In his introductory remarks, Dr. Eldon Ross, Director of the Southeastern Forest Experiment Station, expressed the hope that the Symposium would lead to ways to alter forest and pest management practices to prevent outbreaks from occurring. He called IPM one of the best means of achieving improved forest productivity. Ross observed that the meeting afforded a twofold opportunity: As a state of the art review of ongoing and potential technology, and for convening a review team to recommend pest management priorities for research allocations.

As keynote speaker, Forest Service Chief Max Peterson observed that the gathering was the first of its kind, and that a decade ago no one knew enough about IPM to get together to talk about it. He also expressed the thought that at some point we must be able to better articulate the IPM concept, in meaningful words rather than catchwords, and said the Symposium's real importance was in identifying practical uses of IPM. The Chief cited the example of IPM work in Boulder, Colorado (see item on "Greenslope", PM News #45) by a group promoting a move toward prevention after years of reactionary control, and how public involvement

was a key to their success. He emphasized that public understanding requires that the public see IPM at work. Peterson briefly reviewed IPM practices that are available for incorporation into management planning, including hazard rating and the IPM Decision Key—some "operational aspects" that demonstrate IPM's practical application.

Tuesday morning's opening session, moderated by Tom Miller (SE Station), was devoted to concepts applicable to each of the four pest management areas that were the subject of the Symposium. Jack Coster (West Va. Univ.), speaking on insect pest management concepts, expressed concern for "overkill" of the IPM idea and stressed the need for direct information on cost/benefits. Echoing the Chief, he emphasized the difficulty in defining IPM, and elaborated his view of it as "intelligent pest management." In describing the importance of decision support systems in forestry, he pointed out that any "system" is characterized by interdependence and performance of the whole rather than the parts.

Allan Jones (Mich. State Univ.) addressed the IPM concept in plant disease, and, while reiterating the difficulty in definition, remarked that IPM had its beginnings in agriculture. He observed that the approaches applicable to forestry involve early identification of a situation through biological/environmental monitoring, evaluation/control strategies using computers, and implementation through delivery of IPM information to decisionmakers in the field. Jones emphasized the need to move from integrated pest management to total crop management, viewed as expanded IPM.

Jack Walstad (Oreg. State Univ.) and Dean Gjerstad (Auburn Univ.) described IPM in vegetation management, pointing out that pest management specialists provide a service, not a product. They mentioned IPM "building blocks" relative to vegetation management, and defined



its function as "efficient channeling of limited site resources into usable forest species rather than non-commercial plant species." They emphasized that vegetation management should have a silvicultural purpose, be compatible with silvicultural practices, have an ecological basis, and be economical, with optimum yield as the final objective.

In describing IPM concepts for vertebrate pests, Rex Marsh (Univ. Cal.-Davis) defined them as "any vertebrates that conflict with man's best interests," observing that all play some role in the ecosystem and that their management has always in a sense been based on IPM. Monitoring was mentioned as an important practice, and Marsh described the major control measures, categorized as either "corrective" or "preventive," stressing that the choice must be based on cost effectiveness and compatibility with other considerations. The point was also made that IPM advancements in animal control depend on well-trained managers and increased research.

Tuesday afternoon's session focused on management of young pine stands, moderated by Dean Gjerstad. Roy Hedden (Clemson Univ.) described insect pests of young pines as "regeneration insects," observing that declining pine regeneration leading to reduced planting densities has had the effect of lowering the threshold for allowable seedling mortality. He stressed that increased attention must be given to pest management in the coming years as increasing quantities of timber will have to come from managed plantations. He also noted that as management intensity increases, so will pest management. Hedden said that the feasibility of increasing control depends on the cost/benefits, and he then described major regeneration pests and their impact on the timber resource.

Bob Anderson (R-8, S&PF) stated that the greatest gains can be made in managing forest diseases at least cost in stands up to 5 years old. He noted that the key to controlling disease problems is prevention, and stressed the importance of determining disease hazard prior to stand establishment. Anderson discussed hazard rating in detail and presented recommended strategies for managing several major diseases.

Larry Nelson (Auburn Univ.) discussing vegetation management, characterized the formative stage of a plantation as its "Wonder Years." He compared pine growth with no weed control to growth following total control and detailed the impacts of vegetation management. Some alternative approaches were presented, with emphasis on interactions of vegetative control practi-

ces with other components of the ecosystem. Citing increased pine growth as the benefit from vegetation management, Nelson observed that some insect/disease pests are associated with silvicultural methods used to control vegetation, and that this is where IPM comes in and where research should be focused.

In discussing animal damage in young stands, Edward Hill (Miss. State Univ.) described questionnaires he sent to industrial foresters, woodland owners, USFS, and others requesting information on animal damage problems encountered on their lands. He found beaver the most damaging vertebrate and noted that the most promising control technique seemed to be removal. Before control is undertaken, both cost/benefits and esthetics must be weighed, and any measures taken must fully consider both applicable legal statutes and public relations aspects. Hill emphasized "anticipating" wildlife damage as an integral part of planning and decisionmaking.

Tom Terry (Weyerhaeuser), the first session's "integrator", focused on managing plantations to minimize pest losses, stressing examination of existing problems as the planning/treatment period progresses. He observed that 1) stand establishment practices significantly affect growth potential and pest losses, and 2) accelerated early growth reduces exposure time to pests but increases biomass. This results in increased surface area available to pest organisms. Managers should strive for "functional diversity" and start regeneration planning during active stand management, not at harvest time. He emphasized management which recognizes "potential" problems, noting that managers must be able to alter practices after observation. In conclusion, he stressed that risk-rating guidelines and economic evaluation of alternatives are essential, and pest monitoring and applicable adjustment in management practices are indispensable.

Harvey Toko (R-8, FPM) moderated Wednesday morning's session on managing stands 6 years and older. Evan Nebeker (Miss. State) opened the session with a discussion of three major insect management tactics applicable to established stands: 1) Doing nothing, 2) direct control, and 3) indirect control. He stated that, based solely on cost effectiveness, the first is sometimes the best approach. He also described the relationship of stand density to beetle infestation spread, and management options involving thinning.

George Blakeslee's (Univ. of Fla.) discussion of disease management in older stands centered



on fusiform rust, annosus root rot, littleleaf disease, and pitch canker. Regarding annosus, he stressed that the key to successful control is prevention, and outlined best management practices for dealing with the disease. Pitch canker was described as an organism that affects the entire pine ecosystem with possible environmental/biotic regulators. Blakeslee recommended integration of preventive practices at the time of plantation establishment. He said that fusiform rust management depends on site index, location, management objectives, investment opportunities, and cost/benefit aspects. Know expected survival and plan accordingly, Blakeslee advised. He then described a fusiform rust growth and yield model.

Jeff Paschke (Potlatch Corp.), discussing vegetation management for established stands, emphasized that the best prevention is maintaining vigorously growing trees. He referred to the relationship between hardwood control and increased pine growth and described the use of pine release herbicides and fire in vegetation management. Paschke characterized hardwoods as persistent species needing continuing control. He also noted the importance of planting quality relative to chemical treatment because defects can cause tree mortality. He urged cooperation with chemical companies to find new chemicals applicable to forestry, emphasizing consideration of long term environmental impacts. He then offered an alternative management scheme, all-age management, which makes extensive use of chemical hardwood control.

Edward Hill summarized some animal damage and control methods described earlier for young stands, and urged weighing cost/benefits, multiple use, and esthetic aspects in decision-making. For established stands, he emphasized that expenditures for animal damage aren't justified unless productivity is threatened. On the other hand, enhancing wildlife production by intensive management that includes damage control constitutes true multiple-use management.

"Integrator" William Leuschner (V.P.I.) urged that pest management tools be incorporated at the planning level, beginning with monitoring (e.g., hazard rating) and including decision support systems. This will lead to better growth and yield and a better return on the investment. At 6+ years, when managers are already locked into a management system, the task is to implement pest management techniques in such a way, given the existing variables, that maximum yield will result. Leuschner expressed

this mathematically as: maximum yield = time before harvest  $\times$  IPM techniques. The pest manager's job, he noted, is to minimize pest control costs within the limits of management constraints. Mathematically delineated, the upshot of it all was: before you disturb the stand, weigh potential risks and costs. Leuschner suggested four focal points for research: 1) More intensive programs because they yield results; 2) biological response evaluation; 3) use of the results from (2) in benefit/cost analysis with the focus on interactions; and 4) technology transfer.

At Wednesday afternoon's session on seed orchards moderated by Walter Kelley (Auburn Univ.), Harry Yates (SE Station) discussed cone and seed insects and described specific monitoring techniques for measuring losses in southern orchards, such as seed x-ray and cone analysis. He also mentioned trapping methods useful in management systems. Yates suggested that insecticide application was the only method for controlling insect-caused seed losses in operational programs, but then explained their limitations, including the effects on nontarget organisms and their temporary efficacy. He felt that while there is good potential for IPM in seed orchards, insecticides will probably remain the method of choice.

Tom Miller (SE Station), in his treatise on diseases affecting seed orchards, stressed procedures and precautions in seedlot handling to avoid disease development. He described southern cone rust and other seedborne diseases and made recommendations regarding control of pitch canker, characterized as a wound-invading organism. Miller emphasized that best management practices include the use of systemic fungicides, biological controls, and resistant stock. He discussed the threat of root disease to seed orchards, pointing out that cultivation practices damage root systems, providing entry points for pathogenic organisms. Recommended management guidelines include proper site selection, using healthy stock, orchard surveillance, minimizing root damage, and stump treatment.

W. B. Jett (N.C. State Univ.) discussed vegetation control in seed orchard management, emphasizing the interactions. He described ground cover as a soil stabilizer, noting that soil must be protected from equipment traffic to minimize compaction. Jett cautioned that there are adverse interactions between brush control and stand management, citing mowing as a cause not only of soil compaction but also of direct injury to trees. He also reported that some growth retardants used on turf grasses



have unknown effects on trees. He mentioned the practicality of using spot herbicide applications and concluded by observing that everything that can be done to manage ground cover will increase seed orchard profitability.

Jeff Jackson (Univ. of Ga.) felt that wildlife management is undertaken either "for more or for less" of the resource. He surveyed the experiences of others with vertebrate damage in seed orchards and found a diversity of above- and below-ground damage. He pointed out that wildlife management problems are different from insect problems because the same rules don't apply, e.g., economic thresholds. After reviewing toxicants and rodenticides used for control, Jackson suggested that repellents are the measure of choice for high-value crops nearing harvest age, and brush cover removal the best approach for long term crops.

Barry Malac (Union Camp), "integrator" for the third session, underscored the concern for the security of our future wood supply by pointing out that the economic value of seed orchards is in the multimillion-dollar range. He mentioned the "intricate matrix of cause and effect" in seed orchards and the need to keep the systems in balance. To be effective, pest management systems must be able to 1) forecast outbreaks, 2) offer options, and 3) provide reliable information for cost/benefit analysis. Essential to the first, Malac said, are monitoring and record-keeping; to the second (depending on the pest), pesticides, removal, prevention, and avoidance. He stressed that site, tree and pest records, and monitoring schedules must be considered in cost/benefit analyses. In conclusion, he recommended several priority research needs for seed orchards: a cone crop inventory/monitoring system, sampling systems and critical threshold levels for pests, improved pesticides, and a target-specific delivery system.

Thursday's wrapup session, moderated by Clark Lantz (R-8, S&PF), dealt with IPM in nurseries. Wayne Dixon (Fla. Div. For.) discussed nursery insect management as a concept where "economic damage is avoided and environmental damage minimized." He reported that some nursery managers don't practice IPM, citing the lack of prerequisite basic and applied research findings among the reasons. He then described IPM approaches in the nursery, with emphasis on cultural practices, adequate site preparation, cover crop selection, proper maintenance, soil conditioning, equipment monitoring, and appropriate pesticide application. Dixon summarized basic information useful for damage appraisal and pest identification, noting that a

key consideration is allowance for local conditions. He concluded that good pest management programs already exist in nurseries, but need to be more thoroughly integrated.

In his discussion of nursery disease management, Walter Kelley emphasized the production of quality seedlings. He mentioned soil amendments as an aid in disease control, and described a nursery system in Australia that utilizes "formalin baths" for workers and equipment entering the nursery area. This approach has reduced disease incidence there and may have applicability in the U.S. Kelly described the use of Bayleton for fusiform rust control and discussed his experience with it at Auburn, recommending that 3-4 applications per year be used.

David South (Auburn) focused on vegetation management in nurseries. He equated vegetation control with habitat management and observed that in non-weed-control situations, with reduced light, temperature, and wind, moisture levels remain high, proportionately increasing disease incidence. South singled out nutsedge as the most important nursery weed and emphasized "sanitation" practices for successful integrated weed management. He also discussed cultivation techniques and the use of heat, mentioning present-day trials with solarization. He said that nursery managers currently tend to rely more on chemicals, less on cultivation, but this approach is not foolproof, and several weed control techniques must be employed.

Jeffrey Jackson, discussing nursery animal control, reaffirmed that the usual economic thresholds don't apply to vertebrate pests, noting that it costs far less to get rid of a few than it does larger populations. He described chemical and trapping methods for seed-destroying vertebrate and bird pests, but urged managers to seek assistance in dealing with Federally-protected wildlife species.

In his summary of pest management in nurseries, integrator John Mexal (N. Mex. State Univ.) characterized it as "interaction between crop and antagonistic agents." Discussing nursery pests in relation to the seedling life cycle, he identified areas where controls can be exercised, pointing to the manipulation of cover crops as the best level at which to control weed, disease, and insect pests. Mexal stressed weighing both need and economy in pesticide strategies. Underscoring the importance of "timing" of nursery operations vis-a-vis benefit/cost, he gave examples of IPM approaches in rust control, pointing to significant cost/benefit improvement when protection is properly timed.



He observed that, as the seedling ages, rust susceptibility drops, and pointed out where management options (including modifying spray schedules) can take advantage of the period of maximum effectiveness. He emphasized that IPM programs must be both cost effective and beneficial, can be used on both pine and cover crops, and require knowledge of both pine and pest life cycles as well as cover-crop management.

In his concluding remarks, Arnett Mace (Univ. Fla.) highlighted the need for effective technology transfer programs and stressed validation of technology under operational management conditions. Control is a misnomer, Mace said, because it suggests total eradication, while management deals with a strategy of use at a reduced level. He pointed out that IPM must be considered in the context of "whole forest management," not separately. Paraphrasing Barry Malac's earlier suggestions, Mace singled out three elements of a successful IPM system: reliable forecasting methods, management options to reduce damage levels, and methods to develop cost/benefit ratios. But he emphasized that any system must be modified according to management goals or objectives, differing environmental conditions, national and local economic situations, and varying sets of operating rules and regulations. Given all the variables, one can choose the system that will reduce pest losses most economically. Referring to models, Mace advised considering those adaptable to personalized computers to permit broad-scale use. He concluded by stating that today's economic conditions speak to funding cooperative programs to maximize problem resolution.

The Symposium Proceedings are being printed and distributed through the University of Georgia's Center for Continuing Education. (Contact Andy Little at the Center, Athens, GA 30602; 404/542-1585.) Susan Branham, IPM Program Writer-Editor, has served as editor and coordinator of the proceedings.

## Lorio Receives USDA Award

Dr. Peter Lorio of the Southern Station received the U.S. Department of Agriculture's Superior Service Award at annual ceremonies held in Washington, D.C., June 12, 1984.

Lorio has been associated with the U.S. Forest Service's Alexandria Forestry Center since 1962. He became project leader in 1976, heading a unit of five scientists studying the quantitative effects of different factors regulating southern pine bark beetle populations and forest loss.

Lorio was cited for his "significant achievements in research and technology transfer to develop a southern pine beetle risk-rating system for pest management specialists and forest managers."

He holds a B.S. from Louisiana State University, an M.S. from Duke, and a Ph. D. from Iowa State.

Prior to joining the Federal Government, Lorio was a soil scientist with Standard Fruit Company in Central America. His research there dealt with the influences of irrigation, fertilization, and soils on banana crops.

## Texas SPB Outbreak Worsens

The SPB is back "in force" in East Texas, reports Ron Billings of the Texas Forest Service in a recent edition of "Texas Forestry," newsletter of the Texas Forestry Association. Billings notes that recent aerial and ground surveys have confirmed earlier TFS predictions that 1984 would be a banner year for the beetle in Texas.

Particularly hard hit have been the National Forests, with the Sam Houston so far reporting some 600-700 multiple tree spots ranging in size up to several hundred acres each. Many other infestations have popped up around pine stands damaged by Hurricane Alicia last summer. Ground crews working on private and industrial forest lands confirm many green infested trees in spots which earlier appeared small on aerial surveys, indicating a large, aggressive SPB population.

PM News will keep readers posted on the situation.

## SPB Information Computerized

Dave Kulhavy described an SPB information/retrieval system in a recent issue of The Consultant.

ESPBRAP- and IPM-issued information and additional publications put out prior to ESPBRAP (before 1974), as well as information disseminated through workshops, symposia and the like, are currently being stored and are available for search and retrieval in a computerized literature file on the Honeywell CP6® computer at Stephen F. Austin State University in Texas. The file is an interactive, user-friendly system adapted from FAMULUS (the indexing system used for catalog/retrieval of research information) and currently contains over 1200 references.



For more details, contact Dave at the School of Forestry, P.O. Box 6109, S.F.A. Station, Nacogdoches, TX 75962; 409/569-3301, or refer to Forest Pest Management Technology Update—Fact Sheet #29 (see citation under Other Publications, p. 8 )

## **Saunders Honored by Forest Service**

In Pest Management News No. 47, we described a cooperative training effort in March and April by the IPM Program, Region 8 pest management specialists, and Texas A&M University Research Associate Dr. Mike Saunders. Mike was recently awarded a Certificate of Appreciation by Dr. Tom Ellis, Director of the Southern Forest Experiment Station, during a seminar at Texas A&M presented by Dr. Robert Buckman, FS Deputy Chief for Research. He was cited for his help in making three workshops (in Georgia, Louisiana, and North Carolina) a success and for providing assistance beyond the usual call of duty. The Certificate recognized him "for assisting the IPM Program in delivering its technology to Federal and State pest management specialists."

Congratulations, Mike!

## **Texas Outbreak Spurs Salvage Operations**

With southern pine beetle populations continuing at epidemic levels in Texas, salvage operations on the National Forests have been accelerated to remove and utilize as much beetle-infested timber as possible. During the May-July period of 1984, 29 million feet of timber was salvaged from these lands. Since October 1983, the total has reached 57.8 million feet. Approximately 25 million board feet was removed from the Four Notch wilderness area on the Sam Houston National Forest alone. Most of this was through a helicopter logging operation necessitated by adverse ground conditions and the large volume of dead timber to be moved.

Due to the large quantity of salvaged material reaching the market and an increasingly large number of spots on the Sam Houston, a vigorous program of cut-and-leave has recently been initiated. To date, more than 18,000 trees have been cut-and-left. However, many of these trees may be salvaged before the suppression effort is finished. (Contributed by Michael Connor, R-8, FPM)

## **New Editor Named for Forest Farmer**

Tom Wiseman was recently appointed editor of "Forest Farmer," official publication of the Forest Farmer Association, which is made up primarily of private, nonindustrial timberland owners in 15 southern States.

Wiseman began his editing career in 1977 with the Southern Forest Experiment Station in New Orleans. He joined the FFA in 1979, becoming associate editor of the magazine 3 years later. In his new post, Tom is responsible for manuscript selection, style, and content. All manuscripts and queries should be submitted to him.

## **SPB Stand Hazard-Rating Programs Available**

Stand hazard rating for SPB has become extremely popular in recent years. Rating systems are now available for all geographic regions in the SPB range. Recommended systems have been assembled in an easy-to-use format for Apple II microcomputers. The program disk contains: ARKANSAS HAZARD for use in Arkansas, TEXAS HAZARD for use in Texas and Louisiana, MS HAZARD B for use in Mississippi and Alabama, PIEDMONT RISK for the Piedmont Region of the Southeast, and MOUNTAIN RISK for the Southern Appalachians.

Copies of the program and the user guidelines may be obtained at no cost by sending a blank diskette to: Nona B. Huckabee, Forest Pest Management, USDA Forest Service, 1720 Peachtree Road NW, Atlanta, GA 30367.

## **Areawide SPB Risk Rating Implemented in Texas**

As part of the project "Toward the Integrated Management of Southern Pine Beetle in East Texas," the Texas Forest Service has developed a procedure that improves the ability to predict where severe SPB problems are likely to occur in the near future. The procedure incorporates an areawide hazard-rating system and infestation location data provided by the computerized SPB Operational Information System that generates areawide risk ratings. Stand hazard rating is also used to identify stands in high-risk areas most likely to be attacked.



The areawide system developed by TFS uses high-altitude aerial photography to rate 18,000-acre grid blocks for SPB susceptibility. Ratings are based on a systematic sample of each grid. Sample plots are classified by forest type (pine host, young pine, or nonhost), percent pine cover (  $<$  or  $\geq$  70 percent of sample plot), pine density (  $<$  or  $\geq$  80 percent crown closure for pine component in sample plot), and landform (bottomland or other terrain). The sampling procedure, designed for simplicity and accuracy, takes about 10 minutes to complete for each grid block. Over 550 grid blocks (covering the entire primary SPB range in east Texas) have been hazard rated using current aerial photography. Ratings were 5, 11, and 84 percent, respectively, for high, moderate, and low hazard.

Recent SPB activity in east Texas has served to validate the areawide system. Records indicate over 40 percent of the SPB infestations reported during 1982-83 occurred in high-hazard grid blocks and over 60 percent of the high-hazard grid blocks had at least one infestation. High-hazard grid blocks contained an average of 14 spots each, whereas low-hazard grid blocks contained fewer than 1 spot per block. Overall, current records indicate the system accurately isolates a large proportion of the total SPB infestations in a relatively small area identified as high hazard.

This risk-rating system uses a combination of area-wide hazard information and an SPB population factor (based on number of infestations detected during the previous 2 years). A proximity factor is added to increase the risk class of grid blocks located adjacent to extreme-risk grid blocks.

Twenty-six high- and extreme-risk grid blocks have been identified, all or part located in the Sam Houston, Sabine, Davy Crockett, and Angelina National Forests.

Risk ratings can be adjusted yearly to account for current SPB trends. High- and extreme-risk areas should be targeted for preventive tactics and given top priority for detection and suppression operations.

## New Entomology Textbook Available

Robert N. Coulson (Texas A&M) and John A. Witter (Univ. of Michigan) are the authors of "Forest Entomology—Ecology and Management," just published by the Interscience Division of John Wiley & Sons, Inc., New York.

This 640-page book, with 350 figures and tables, will be useful as a professional reference tool. The text is organized to accommodate various teaching formats and levels, and includes extensive references to recent literature in entomology and related fields. A comprehensive treatment of integrated pest management in forests is presented, as well as concepts in the application of mathematical modeling and computerized information systems for decision-making.

For more information, contact Dr. Robert N. Coulson, Department of Entomology, Texas A&M University, College Station, TX 77843, 409/845-9725.

## Multipest Survey Underway

The Florida Division of Forestry recently initiated a statewide multipest survey to assess the incidence, distribution, and impact of annosus root rot and associated insect and disease pests in Florida's thinned slash pine plantations. IPM cooperator Dr. Sam Alexander of V.P.I. and Dr. George Ryan, statistician with Forest Pest Management in Region 8, helped design the "game plan." So far, sample information has been gathered from more than 300 pine plantations thinned during the last 10 years, representing some 75,000 acres. The project applies sampling procedures developed through the IPM Program, and is being supported by R-8, FPM.

## SAMTAM Available for Distribution

SAMTAM and SAMTAM II, sawmill analysis models for green and beetle-killed timber, respectively (see IPM Research Highlights, Pest Management News No. 44), are now available for distribution. The models are designed to aid the mill manager and procurement forester in answering such questions as: *How much profit or loss will a sawmill experience in processing a log of given diameter and grade?* or *How is this profit or loss affected by stage of deterioration following beetle infestation?*

The SAMTAM models are written in Apple-soft for Apple II microcomputers. Copies of the program and a user's manual may be obtained at no cost by sending two blank diskettes to: Nona B. Huckabee, Forest Pest Management, USDA Forest Service, 1720 Peachtree Road NW, Atlanta, GA 30367.



**Southern Forest  
Experiment Station**

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## Hazard-Rating System Validated

As part of the SPB demonstration project in Texas, all commercial pine stands in Polk and Tyler counties were hazard rated using 1978 color infrared aerial photography and the Texas SPB stand hazard-rating system. This system is based on categories of pine basal area, stand height, and landform. Stand ratings in the two-county demonstration area were recently updated using 1981 high altitude photography.

The updated results revealed that 58 percent of the area was classified as host type. Of this, 38 percent was low hazard, 14 percent moderate, 4 percent high, and 2 percent extreme hazard. An additional 27 percent was represented by pine regeneration areas, while 14 percent of the demonstration area involved permanent non-host areas such as hardwood stands, agricultural land, or nonforested areas.

Fifty-two confirmed SPB infestations were detected in Polk and Tyler counties in 1983, 37 percent in high- and extreme-hazard stands. On an equal land unit basis, there were 0.27 spots per 1000 acres of extreme-hazard areas, 0.19 per 1000 acres of high-hazard, 0.08 of moderate, and 0.03 of low-hazard areas. Although a majority of the spots actually occurred in moderate- and low-hazard areas, these per-acre results indicate that the system identifies conditions preferred by the SPB. These are the stands in greatest need of management, highest in value, and where SPB management actions should be focused. Spots in moderate- and low-hazard stands may be influenced generally by the greater abundance and availability of resource in these categories, or by extenuating conditions such as lightning or storm damage,

site or tree disturbance, and proximity to high-hazard stands or high population outbreak areas. (Contributed by Charles M. Bryant V, Texas Forest Service)

## Two More Fact Sheets Reissued

SPB Fact Sheets Nos. 18 and 24 have recently been revised and reissued by the Southern Region. The first deals with pile-and-burn procedures for infested trees and the second with buffer strips to control SPB spot growth in salvage removal and cut-and-leave operations. Both are available from: USDA Forest Service, Region 8, 1720 Peachtree Road NW, Atlanta, GA 30367.

## Other Publications

Billings, R.F. Setting control priorities for the southern pine beetle. For. Bull. R8-FB/P8. Atlanta, GA: U.S. Department of Agriculture, Forest Service, Southern Region; 1984. (SPB Fact Sheet No. 3—Revised). 2 p.

Dickens, J. C.; Payne, T. L.; Ryker, L. C.; Rudinsky, J. A. Single cell responses of the Douglas-fir beetle, *Dendroctonus pseudotsugae* Hopkins (Coleoptera: Scolytidae), to pheromones and host odors. J. Chem Ecol. 10(4):583-599; 1984.

Kulhavy, D. L. A computerized literature retrieval system for the southern pine beetle. For. Bull. R8-FB/P10. Atlanta, GA: U.S. Department of Agriculture, Forest Service, Southern Region; 1984. 2 p.